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# METROLOGY FOR ELECTROMAGNETIC TECHNOLOGY: A BIBLIOGRAPHY OF NBS PUBLICATIONS

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Edited by
R.A. Kamper
K.E. Kline

National Bureau of Standards
U.S. Department of Commerce
Boulder, CO 80303

August 1982

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Electromagnetic Technology Division
Center for Electronics and Electrical Engineering
National Engineering Laboratory
National Bureau of Standards
U.S. Department of Commerce
Boulder, CO 80303

August 1982

U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, Secretary

NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director

CONTENTS


| | Page |
|---|---|
| INTRODUCTION | 1 |
| MICROWAVE METROLOGY | 3 |
| OPTICAL ELECTRONIC METROLOGY | 12 |
| ELECTROMAGNETIC WAVEFORM METROLOGY | 21 |
| CRYOELECTRONIC METROLOGY | 29 |
| SUPERCONDUCTORS AND MAGNETIC MATERIALS | 42 |
| AUTHOR INDEX | 53 |

# METROLOGY FOR ELECTROMAGNETIC TECHNOLOGY: A BIBLIOGRAPHY OF NBS PUBLICATIONS

Edited by

Robert A. Kamper and Kathryn E. Kline

This bibliography lists the publications of the personnel of the Electromagnetic Technology Division of NBS in the period from January 1970 through December 1981. A few earlier references that are directly related to the present work of the division are included.

Key words: Cryoelectronics; electromagnetic metrology; lasers; microwaves; optical fibers; superconducting materials; time domain metrology.

## INTRODUCTION

The Electromagnetic Technology Division was formed during the Reorganization of NBS in April 1978, by combining parts of the former Electromagnetics and Cryogenics Divisions. It develops measurement methods and standards, and provides metrological support, for: microwave circuits, laser systems, optical communication equipment, systems using transient or pulsed electromagnetic phenomena, cryoelectronics, superconductors and other unusual electrical engineering materials. For the individual staff members of the division, the reorganization brought a realignment of long-term goals but little immediate discontinuity in their work. It therefore makes good sense that this bibliography should cover a period beginning some time before the reorganization, so as to include at least the more recent origins of the present work of the division. The editors have attempted to include all work published by the present staff members of the division, while they were employees of NBS, in the period from January 1970 through December 1981. There are a few exceptions, where work that is totally unrelated to the present program has been excluded or where work by authors now in other parts of NBS has been included because of its special significance. A few papers published before 1970 have also been included because of their direct relationship to the present program.

There are several other sources that may be useful to the reader who is interested in activities at NBS connected with electromagnetic metrology. A companion bibliography to this one lists the publications of the Electromagnetic Fields Division. Its topics include metrology for: antennas, satellite communications equipment, electromagnetic interference and hazard. Three bibliographies of the publications of the former Electromagnetics Division have been published: NBSIR 73-320 (July 1972 - June 1973); NBSIR 74-395 (July 1973 - June 1974); NBSIR 75-818 (July 1974 - June 1975). These were preceded by a series of unpublished reports (edited by H. M. Altschuler) that cover the period back to 1956. An excellent summary of the whole field of electromagnetic metrology as it stood in 1967 was published as a special issue of the IEEE Proceedings (volume 55, June 1967). Advances in the following decade were described in another special issue of the same journal (volume 66, April

## A NOTE ON ABBREVIATIONS

Most readers will be familiar with the commonly used abbreviations for the names of the various professional journals that appear in this bibliography. There are also some publication series that are peculiar to NBS and may call for explanation. They are:

NBSIR - NBS Interagency/Internal Report
NBS TN - NBS Technical Note
NBS SP - NBS Special Publication
NBS HB - NBS Handbook
NBS JRES - NBS Journal of Research
NBS Monogr. - NBS Monograph

## Purchase Procedures and Document Availability

NBS Technical Notes and Special Publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Orders must be accompanied by postal money order, express money order, or check made out to the Superintendent of Documents.

NBS Interagency/Internal Reports (NBSIRs) may be purchased from the National Technical Information Service, Springfield, VA 22161. Orders must be accompanied by postal money order, express money order, or check made out to the NTIS.

Reprints of papers published in non-NBS media may be available in limited quantities from the authors.

## ACKNOWLEDGMENTS

A large part of the labor of preparing a bibliography is spent on collecting and arranging the material. We thank Frances Brown, Edie DeWeese, Jessie Page, and Sheila Aaker for their assistance with these chores. The prime source of material was the NTIS file, with access through the Lockheed Dialog System. This was supplemented with material supplied by the individual authors.

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AUTHOR INDEX

Adair, R. T.: 8, 33, 34, 35, 36, 37, 38
Agy, D. L.: 11, 12
Allred, C. M.: 4, 7, 8, 10, 11, 22
Andrews, J. R.: 15, 21, 22, 23, 24, 25, 26, 27, 28, 31
Angerhofer, P. E.: 50
Arp, V. D.: 47, 48, 50
Ashley, J. R.: 39

Baldwin, E. E.: 21, 22, 23, 24, 25
Beers, Y.: 17
Bender, B. K.: 33
Birmingham, B. W.: 50
Blank, W.: 28
Bloom, L. R.: 14
Bouille, R.: 27
Braginski, A. I.: 45

Case, W. E.: 15, 17, 18, 19
Campbell, E.: 9
Campbell, W. H.: 30,36
Carelli, P.: 29
Chamberlain, G. E.: 12, 15, 16
Chen, H. S.: 42
Childs, G. E.: 52
Clague, F. R.: 11
Clark, A. F.: 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52
Clem, J. R.: 49
Cohen, D.: 40
Collins, G. J.: 16, 17
Cook, A. R.: 16, 17, 18
Cook, C. C.: 10
Costabile, G.: 29
Counas, G. J.: 10
Cozannet, A.: 22
Cromar, M. W.: 29

Cupp, J. D.: 33, 37, 39, 40, 41

Dalder, E. N. C.: 45
Danielson, B. L.: 12, 13, 14, 15, 16, 17, 18, 19, 33, 37
Day, G. W.: 12, 13, 14, 15, 16, 17, 18, 19
Deason, V. A.: 49, 51
Debeau, J.: 22
Dimmock, J. D.: 20
Dinger, R. J.: 36
Driver, L. D.: 4
Dynes, R. C.: 35
Dziuba, R. F.: 36, 37

Ebbesen, H.: 3
Ecklund, W. L.: 10
Edelsack, E. A.: 40
Edrich, J.: 32, 33, 34, 35
Ekin, J. W.: 42, 43, 44, 45, 46, 47, 48, 49
Ekstrom, M. P.: 28
Engen, G. F.: 3, 4, 5, 6, 7, 8, 9, 10, 11
Estin, A. J.: 6
Evenson, K. M.: 17, 18, 19, 39, 40, 41

Fickett, F. R.: 37, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52
Flynn, T. M.: 34, 50
Fowlkes, C. W.: 50
Franzen, D. L.: 12, 13, 14, 15, 16, 17, 18, 19
Frederick, N. V.: 31, 32, 33, 34, 35, 36, 38, 41
Frush, C. L.: 22
Frye, G. J.: 28
Fujii, G.: 42, 44

Gallawa, R.: 13
Gans, W. L.: 21, 22, 23, 24, 25, 27
Gayley, R. I.: 33
Geist, J.: 18
Genens, L.: 43

Giarrantano, P. J.: 31
Ginsberg, D. M.: 35
Gold, R. E.: 46
Goldfarb, R. B.: 42
Goodrich, L. F.: 42, 43
Goree, W. S.: 37, 38, 39
Gray, E. M.: 14
Gruzensky, P. M.: 17, 18, 19
Guillaume, M. E.: 21

Halford, D.: 19
Hamilton, C. A.: 17, 18, 21, 29, 30, 31, 32, 33, 34, 38, 39
Hanson, A. G.: 14
Harris, R. E.: 30, 31, 32, 33, 34, 35, 36
Hartwig, G.: 44, 45
Harvey, M. E.: 4, 7
Havemann, R. H.: 33
Haynes, W. M.: 49
Heim, L.: 7
Ho, J. C.: 45, 46
Hobbs, R. D.: 29
Hoblitt, R.: 45
Hoer, C. A.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 22, 36, 37, 38
Holt, D. R.: 26, 27
Honda, T.: 25, 27
Hudson, P. A.: 3, 6, 7, 8, 10, 11, 38
Hust, J. G.: 48, 51

Ives, J. T.: 29

Jarvis, S.: 37
Jennings, D. A.: 17, 19
Jesch, R. L.: 6, 9
Jickling, R. M.: 3, 26
Johnson, E. G.: 14, 15, 16, 33, 36, 38, 39
Johnson, W. L.: 16

Kamper, R. A.: 4, 5, 34, 35, 36, 38, 39
Kaplan, S. B.: 30, 31, 43
Kasen, M. B.: 45, 46, 47
Kautz, R. L.: 29, 30, 31, 32, 33
Kim, E.: 12, 13
Kim, S. H.: 43
King, G. B.: 46
Klein, G. P.: 18
Komarek, E. L.: 4, 5, 7, 9
Kose, V. E.: 40, 41
Kropschot, R. H.: 52

Larsen, E. B.: 22, 24
Larsen, N. T.: 4, 5, 6, 7, 8, 9, 10
Larson, W.: 10, 11
Larson, D. R.: 12
Larson, E.: 45
Lawton, R. A.: 10, 11, 22, 23, 24, 25, 26
Little, W. E.: 7
Lloyd, F. L.: 21, 29, 30, 31, 32

Mahler, R. J.: 19
Manney, C. H.: 4, 8
McCarthy, S. M.: 29
McCaa, W. D.: 26, 28
McDonald, D. G.: 29, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41
McHenry, H. I.: 42, 45, 46, 47
McNeil, J. R.: 16, 17
Melquist, D. G.: 8
Mikesell, R. P.: 47
Mockler, R. C.: 48
Mullen, L. O.: 18, 19, 36, 40, 41

Nahman, N. S.: 21, 22, 23, 24, 25, 26, 27, 28
Nelson, R. E.: 3, 5, 6, 10
Newton, R. N.: 50
Nisenoff, M.: 37, 38

Olien, N. A.: 37, 38, 39
Ondrejka, A. R.: 8, 10, 11, 21, 22, 23, 28
O'Sullivan, W. J.: 48

Patton, C. E.: 42
Persson, K. B.: 16, 17
Peterson, F. R.: 18, 19, 33, 37
Peterson, R. L.: 18, 21, 29, 30, 31, 32, 33, 34, 35, 40
Phelan, R. J.: 12, 17, 18, 19, 20
Powell, R. L.: 43, 44, 46, 47, 50, 51
Pyatt, K. W.: 17

Radebaugh, R.: 34, 38, 39, 43, 44
Ranney, M. A.: 42, 43
Rao, K. V.: 42
Rasmussen, A. L.: 15, 17, 18, 19
Rebuldella, G.: 4
Read, D. T.: 44
Reed, R. P.: 43, 44, 46, 47, 48, 49, 50, 51
Reeve, G. R.: 8, 9
Reite, M.: 30, 32, 33, 35
Riad, S. M.: 22, 23, 24
Richards, P. L.: 30, 32
Ries, F. X.: 4
Risley, A. S.: 33, 37, 39
Roe, K. C.: 6, 7, 8
Rosenblum, J.: 45, 47
Russell, D. H.: 11
Russell, T. W.: 18, 19

Sanders, A. A.: 15, 16
Saulsbery, L. F.: 10
Scavvanec, A.: 25, 26
Schmidt, L. B.: 16, 17
Schramm, R. E.: 44, 45, 50, 51
Scott, J. F.: 48
Sekine, H.: 42

Shen, T. M.: 30, 32
Siegwarth, J. D.: 34, 38, 39
Silver, A. H.: 36, 41
Simmonds, M. B.: 36, 37, 38, 39
Simmons, W. R.: 17
Simpson, P. A.: 6, 8, 11, 13, 16
Smith, R. L.: 16, 18, 19
Sorenson, C. M.: 48
Soulen, R. J., Jr.: 31
Sparks, L. L.: 47, 50
Speciale, R. A.: 4
Stanley, W. D.: 36
Steyert, W. A.: 47
Stoltenberg, R. E.: 4
Stubenrauch, C. F.: 16
Suenaga, R. E.: 43
Sullivan, D. B.: 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 49, 50
Superszynski, M. J.: 44

Tachikawa, K.: 42
Taggart, H. E.: 5
Timmerhaus, K. D.: 46, 48
Trapani, R. J.: 48, 49
Treado, M. J.: 5
Tryon, P. V.: 9, 50

Van Reuth, E. C.: 49
Van Vechten, D.: 29, 31
Vorreiter, J. W.: 31

Wakefield, J.: 7
Wallace, G. H.: 52
Wang, S. T.: 43
Weidman, M. P.: 3, 4, 5, 9, 10
Wells, J. S.: 18, 19, 37, 40, 41
Werner, P. E.: 8, 12
West, E. D.: 17, 18

Weston, W. F.: 48
Wharton, M. J.: 22
Whittemore, T.: 26
Wolf, S. A.: 38
Workman, J. L.: 5

Yates, B. C.: 7, 10
Young, M.: 12, 13, 14, 15, 21, 22, 23

Zapf, T. L.: 4, 7
Zeitlin, B. A.: 43
Zimmerman, J. E.: 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41
Zimmerman, J. T.: 30, 32, 25

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